

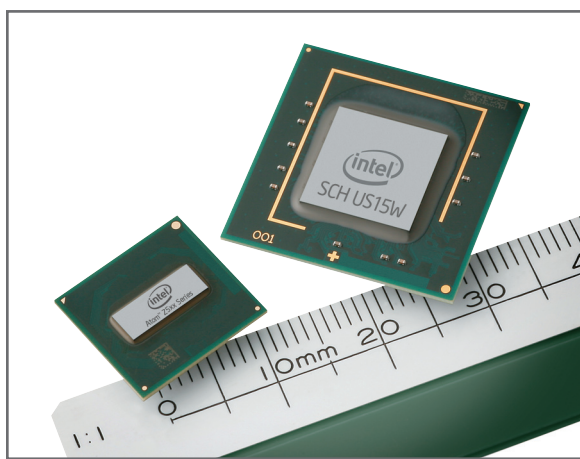
Product Brief

Intel® Atom™ Processor

Embedded Computing



Intel® Atom™ Processor Z5xx Series for Embedded Computing



Product Overview

The Intel® Atom™ processor Z5xx series delivers the benefits of Intel® architecture for small form factor, thermally constrained and fanless embedded applications. Implemented in 45nm technology, these power-optimized processors provide robust performance-per-watt in an ultra-small 13x14 mm package. Featuring embedded lifecycle support, the Intel Atom processors are ideal for many embedded market segments such as in-vehicle infotainment, medical, interactive client (kiosks, point-of-sale terminals), gaming and industrial control. They remain software compatible with previous 32-bit Intel® architecture and complementary silicon.

These single-core processors are validated with the Intel® System Controller Hub US15W, which integrates a graphics memory controller hub, and I/O controller hub into one small 22x22 mm package. This new, two-chip platform provides more than 80% reduction in total footprint over the previous-generation three-chip solution, based on the Intel® Celeron® M processor Ultra Low Voltage 423^A with Mobile Intel® 945GME Express chipset (See table below).

Product Highlights

- Available in two options:
 - Intel® Atom™ processor Z530^A at 1.6 GHz core speed with 533 MHz CMOS front-side bus (FSB), 2.2 watts thermal design power (TDP) and support for Hyper-Threading Technology¹ (HT Technology)
 - Intel® Atom™ processor Z510^A at 1.1 GHz core speed with 400 MHz CMOS FSB, and 2.0 watts TDP
- Intel's hafnium-based 45nm Hi-k silicon process technology reduces power consumption, increases switching speed, and significantly increases transistor density over previous 65nm technology.
- Multiple micro-ops per instruction are combined into a single micro-op and executed in a single cycle, resulting in improved performance and power savings.
- In-order execution core consumes less power than out-of-order execution.

New two-chip Intel® platform provides more than 80% reduction in total footprint over previous-generation three-chip Intel platform.

Two-Chip Platform		Three-Chip Platform	
Intel® Atom™ processor (13x14 mm)	182 mm ²	Intel® Celeron® M processor Ultra Low Voltage 423 (35x35 mm)	1225 mm ²
Intel® System Controller Hub US15W (22x22 mm)	484 mm ²	Intel® 82945GME Graphics Memory Controller Hub (37.5x37.5 mm)	1406 mm ²
		Intel® I/O Controller Hub 7-M (31x31 mm)	961 mm ²
Total footprint of two chips	666 mm²	Total footprint of three chips	3592 mm²

Product Highlights (continued)

- HT Technology (1.6 GHz SKU only) provides high performance-per-watt efficiency in an in-order pipeline. HT Technology provides increased system responsiveness in multi-tasking environments. One execution core is seen as two logical processors, and parallel threads are executed on a single core with shared resources.
- New C6 state removes power from processor core and caches, resulting in less leakage than C4 state.
- Split VTT rail removes power from ~90% of the I/O, reducing C6 state leakage and achieving a significantly lower idle power.
- Dynamic L2 cache sizing reduces leakage due to transistor sleep mode.
- SSE3 instruction set enables software to accelerate data processing in specific areas, such as complex arithmetic and video decoding.
- Enhanced Intel SpeedStep® Technology reduces average system power consumption.
- Execute Disable Bit² prevents certain classes of malicious “buffer overflow” attacks.
- Along with a strong ecosystem of hardware and software vendors, including members of the Intel® Embedded and Communications Alliance (intel.com/go/eca), Intel helps cost-effectively meet development challenges and speed time-to-market.
- Embedded lifecycle support protects system investment by enabling extended product availability for embedded customers.

Intel® Atom™ processors for Embedded Computing

Product Name	Product Number	Core Speed	Front-Side Bus	L2 Cache	L1 Cache	Thermal Design Power ³	Support for HT Technology	Tjunction	Package
Intel® Atom™ processor Z530 ⁴	AC80566UE025DW	1.6 GHz	CMOS, 533 MHz, 32-bit address	512 kB	32 kB instruction cache, 24 kB data cache	2.2 watts	Yes	90° C	441-ball lead-free FCBGA8 USFF 13x14 mm
Intel® Atom™ processor Z510 ⁴	AC80566UC005DE	1.1 GHz	CMOS, 400 MHz, 32-bit address	512 kB	32 kB instruction cache, 24 kB data cache	2.0 watts	No	90° C	441-ball lead-free FCBGA8 USFF 13x14 mm

Intel in Embedded and Communications: intel.com/go/embedded

⁴ Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_number for details.

¹ Hyper-Threading Technology (HT Technology) requires a computer system with an Intel processor supporting HT Technology, and an HT Technology-enabled chipset, BIOS and operating system.

² Enabling Execute Disable Bit functionality requires a platform or system with a processor with Execute Disable Bit capability and a supporting operating system.

³ The TDP specification should be used to design the processor thermal solution. TDP is not the maximum theoretical power the processor can generate.

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Software

The following operating systems and BIOSs are currently supported on the Intel Atom processor Z5xx series and the Intel System Controller Hub US15W. In addition, Intel provides software drivers for this platform. Please contact your preferred vendor or an Intel representative for operating system and BIOS options.

Operating System	Contact
Microsoft Windows* XP Embedded SP2	Intel provides drivers
Microsoft Windows* XP SP2	Intel provides drivers
Microsoft Windows* WEPOS SP2	Intel provides drivers
Microsoft Windows* Embedded CE 6.0	Adeneo, BSQUARE, WiPro
QNX Neutrino*	QNX Software Systems
Red Hat Embedded Linux*	Red Hat
Red Flag Linux*	Red Flag Software
WindRiver Linux*	WindRiver Systems

BIOS/Contact

American Megatrends, Inc.

Insyde Software

Phoenix Technologies, including AwardCore*

